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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/635,864	08/06/2003	Donald R. Loveday	1999U026.US-CON3	2116

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UNIVATION TECHNOLOGIES LLC  
5555 SAN FELIPE, SUITE 1950  
HOUSTON, TX 77056

EXAMINER
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CHEUNG, WILLIAM K

ART UNIT	PAPER NUMBER
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1796

MAIL DATE	DELIVERY MODE
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07/25/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>		<b>Applicant(s)</b>	
	10/635,864		LOVEDAY ET AL.	
	<b>Examiner</b>		<b>Art Unit</b>	
	WILLIAM K. CHEUNG		1796	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 21 May 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-12, 14-16, 18 and 20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12, 14-16, 18 and 20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Request for Continued Examination***

1. The request filed on May 21, 2008 for a Request for Continued Examination (RCE) under 37 CFR 1.53(d) based on parent Application No. 10/635,864 is acceptable and a RCE has been established. An action on the RCE follows.
2. In view of amendment filed May 21, 2008, claims 13, 17, 19 have been cancelled. Claims 1-12, 14-16, 18, 20 are pending.

### ***Double Patenting***

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claims 1-12, 14-16, 18, 20 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-15 of copending Application No. 10/772,823. Although the conflicting claims are not

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identical, they are not patentably distinct from each other because claims 1-12, 14-16, 18, 20 of instant application and claims 1-15 of copending Application No. 10/772,823 are related a genus and its species.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Applicant's arguments filed May 21, 2008 have been fully considered but they are not persuasive. Applicants agree to file a terminal disclaimer when the claims are found allowable. Therefore, claims 1-12, 14-16, 18, 20 stand ODP rejected until a terminal disclaimer is filed.

#### ***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

#### ***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
7. Claims 1-12, 14-16, 18, 20 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Welborn, Jr. (US 5,124,418) for the reasons adequately set forth from paragraph 6 of the office action of January 25, 2007.

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1. (Currently Amended) A bimodal polyethylene comprising ethylene derived units and units derived from at least one of a C<sub>4</sub> to C<sub>12</sub> olefin;

wherein the polyethylene has a density of from 0.940 to 0.970 g/cm<sup>3</sup>;

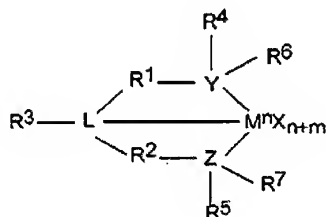
an I<sub>21</sub>/I<sub>2</sub> of 80 or more;

a residual zirconium or hafnium metal content;

a Mw/Mn of from 20 to 60; and

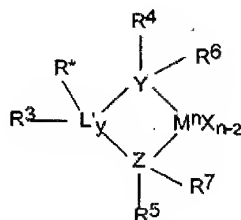
wherein the polyethylene comprises a high molecular weight component and a low molecular weight component, the high molecular weight component present from 40 to 60 weight percent based on the total polyethylene, and wherein the high molecular weight component has a weight average molecular weight Mw of greater than 100,000 a.m.u., and wherein the high molecular weight component has a Mw/Mn between 4.50 and 6.88.

wherein said bimodal polyethylene is formed in a single reactor by contacting olefins and a catalyst composition comprising a Group 15 containing compound and a bulky ligand metallocene catalyst compound; wherein the Group 15 containing metal compound is represented by the formulae:



or

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wherein M is a Group 4, 5 or 6 metal;

each X is independently a leaving group;

y is 0 or 1;

n is the oxidation state of M;

m is the formal charge of the ligand comprising the YZL or YZL' groups;

L is Nitrogen;

L' is a Group 15 or 16 element or Group 14 containing group;

Y is Nitrogen;

Z is Nitrogen;

R<sup>1</sup> and R<sup>2</sup> are independently a C<sub>1</sub> to C<sub>20</sub> hydrocarbon group, a heteroatom containing group having up to twenty carbon atoms, silicon, germanium, tin, lead, or phosphorus; wherein R<sup>1</sup> and R<sup>2</sup> may be interconnected to each other;

R<sup>3</sup> is absent or a hydrocarbon group, hydrogen, a halogen, a heteroatom containing group;

R<sup>4</sup> and R<sup>5</sup> are independently an alkyl group, an aryl group, substituted aryl group, a cyclic alkyl group, a substituted cyclic alkyl group, a cyclic arylalkyl group, a substituted cyclic arylalkyl group or a multiple ring system;

wherein

R<sup>4</sup> and R<sup>5</sup> may be interconnected to each other;

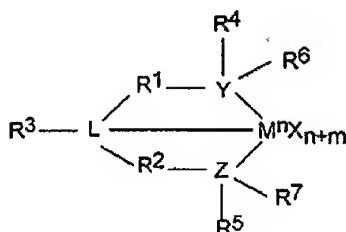
R<sup>6</sup> and R<sup>7</sup> are independently absent, hydrogen, an alkyl group, halogen, heteroatom or a hydrocarbyl group;

R<sup>\*</sup> is absent, hydrogen, a Group 14 atom containing group, a halogen, or a heteroatom containing group, and

wherein a polyethylene pipe comprising the bimodal polyethylene has a predicted D-4 Tc for 110 mm pipe of less than -5°C when tested according to ISO DIS 13477/ASTM F1589.

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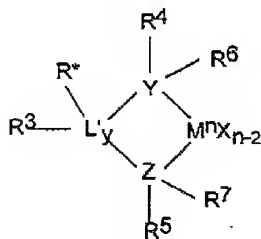
20. (Currently Amended) A bimodal polyethylene consisting of ethylene derived units and units derived from at least one of a C<sub>4</sub> to C<sub>12</sub> olefin; wherein the polyethylene consists of a density of from 0.940 to 0.970 g/cm<sup>3</sup> an I<sub>21</sub>/I<sub>2</sub> of 80 or more; a residual zirconium or hafnium metal content; a Mw/Mn of from 20 to 80; and wherein the polyethylene consists of a high molecular weight component and a low molecular weight component, the high molecular weight component present from 40 to 60 weight percent based on the total polyethylene, and wherein the high molecular weight component has a weight average molecular weight Mw of greater than 100,000 a.m.u., and wherein the high molecular weight component has a Mw/Mn between 4.50 and 6.88, wherein said bimodal polyethylene consists of a nitrogen containing ligand detectable by High Resolution Mass Spectroscopy (HRMS), wherein said bimodal polyethylene is formed in a single reactor by contacting olefins and a catalyst composition comprising a Group 15 containing compound and a bulky ligand metallocene catalyst compound; wherein the Group 15 containing metal compound is represented by the formulae:



or



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wherein  $M$  is a Group 4, 5 or 6 metal;

each  $X$  is independently a leaving group;

$y$  is 0 or 1;

$n$  is the oxidation state of  $M$ ;

$m$  is the formal charge of the ligand comprising the  $YZL$  or  $YZL'$  groups;

$L$  is Nitrogen;

$L'$  is a Group 15 or 16 element or Group 14 containing group;

$Y$  is Nitrogen;

$Z$  is Nitrogen;

$R^1$  and  $R^2$  are independently a  $C_1$  to  $C_{20}$  hydrocarbon group, a heteroatom containing group having up to twenty carbon atoms, silicon, germanium, tin, lead, or phosphorus; wherein  $R^1$  and  $R^2$  may be interconnected to each other;

$R^3$  is absent or a hydrocarbon group, hydrogen, a halogen, a heteroatom containing group;

$R^4$  and  $R^5$  are independently an alkyl group, an aryl group, substituted aryl group, a cyclic alkyl group, a substituted cyclic alkyl group, a cyclic arylalkyl group, a substituted cyclic arylalkyl group or a multiple ring system;

wherein

$R^4$  and  $R^5$  may be interconnected to each other;

$R^6$  and  $R^7$  are independently absent, hydrogen, an alkyl group, halogen, heteroatom or a hydrocarbyl group; and

$R^*$  is absent, hydrogen, a Group 14 atom containing group, a halogen, or a heteroatom containing group, and

wherein a polyethylene pipe comprising the bimodal polyethylene has a predicted D-4 Tc for 110 mm pipe of less than  $-5^\circ\text{C}$  when tested according to ISO DIS 13477/ASTM F1589.

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Welborn, Jr. (abstract; col. 16, line 21-40) discloses an olefin polymerization catalyst comprising at least one metallocene and at least one non-metallocene transitional metal compounds. Welborn, Jr. (col. 3, line 38-46; col. 9, line 42-59) discloses that the disclosed catalyst can be used to prepare polyolefin with multi-modal molecular weight distribution which generically includes the "bimodal" feature as claimed. Welborn, Jr. (col. 5, line 34 to col. 8, line 56) clearly disclose a catalyst system that can give rise to residual zirconium or hafnium metal in the polyolefin product produced, despite that the catalyst can be recovered to some degrees (col. 9, line 16-24). Welborn, Jr. (col. 13, line 3-8) clearly disclose a range of transition metal content the disclosed polymerization process ranges from 0.01 to 50 ppm, preferably ranges from about 0.1 to 3 ppm.

Welborn, Jr. (col. 10, line 54-60) indicates that the polyolefin produced are polymer blends of HDPE and ethylene-propylene copolymers.

Regarding the claimed weight average molecular weight, Welborn, Jr. (col. 16, line 41-68; col. 17, line 35, 55) discloses HDPE/ethylene-butene copolymer having a weight average molecular weight of 663,000. Regarding the claimed density, Welborn, Jr. (col. 16, line 67; col. 17, line 37, 57) discloses a density of 0.96 g/cc.

Regarding the claimed "Mw/Mn of from 4.50 to 6.88", Welborn, Jr. (col. 15, line 34-37) clearly indicates the range of Mw/Mn from 2.5 to 100 that can be prepared by the process disclosed.

In view of the substantially identical polymerization process, the type of monomers and comonomers used in the polymerization process, and the substantially identical molecular weight and molecular weight distribution, the examiner has a reasonable basis that the claimed residual amount of zirconium or hafnium metal,  $I_2$ ,  $I_{21}/I_2$ , the notch tensile properties (ASTM-F1473), the aging property of claims 8-10, the MD tear properties, the properties of the pipe (the predicted D-4 Tc for 110 mm pipe....) made by the claimed bimodal polyethylenes, and the claimed the high molecular weight component of the bimodal polyethylene has a molecular weight distribution between 4.5 and 6.88 are inherently possessed in Welborn, Jr. Since the PTO does not have proper means to conduct experiments, the burden of proof is now shifted to applicants to show otherwise. In re Best, 562 F.2d 1252, 195 USPQ 430 (CCPA 1977); In re Fitzgerald, 205 USPQ 594 (CCPA 1980).

Regarding the claimed "bis-amidic catalyst", applicants must recognize that "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

### ***Response to Arguments***

Applicant's arguments filed May 21, 2008 have been fully considered but they are not persuasive.

Applicants argue that the prior art is silent on that the high molecular weight component of the bimodal polyethylene has a molecular weight distribution between 4.5 and 6.88. However, applicants fail to recognize that Welborn, Jr. (col. 15, line 34-37) clearly indicates the range of Mw/Mn from 2.5 to 100, which clearly meets the molecular weight range as claimed.

Although the working examples of Welborn, Jr. do not include a polymer sample having a molecular weight distribution of from 4.5 to 6.88, applicants must recognize that the teachings of a prior art is not limited to its preferred embodiment; the entire prior art can be used as a teaching material.

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Applicants argue that the amended claims are now allowable in view of the claimed “nitrogen containing ligand detectable by High Resolution Mass Spectroscopy (HRMS)”. However, the examiner disagrees because Welborn, Jr. (col. 6, line 51; col. 12, line 12-15) clearly disclose a catalyst system comprising a nitrogen containing liquid or compounds. Although applicants argue that the amount of nitrogen in the claimed bimodal polyethylene will be at least two times greater than the nitrogen from a bridge suggested by Welborn, applicants must recognize that the argued “amount” difference is not supported by the claims as written.

Although applicants argue that the claimed “bis-amidic catalyst” unexpectedly results polymers with improved short chain branching in the higher molecular weight component of the recited copolymer, Applicants fail to provide any comparative data to support such argument. Further, what does it mean by the argued “improved short chain branchings in the higher molecular weight component”? Does it mean more, or less, short chain branchings?

In view of the reasons set forth above, the 102-3 rejection set forth is maintained.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William K Cheung whose telephone number is (571) 272-1097. The examiner can normally be reached on Monday-Friday 9:00AM to 2:00PM; 4:00PM to 8:00PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David WU can be reached on (571) 272-1114. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/William K Cheung/  
Primary Examiner, Art Unit 1796

William K. Cheung, Ph. D.

Primary Examiner

July 9, 2008

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